

# FULL PETROCHEMICAL PLANT DECONTAMINATION INCLUDING THE CRITICAL PATH QUENCH SYSTEM

## Project

In 2012, ZymeFlow and a petrochemical plant in Kuwait started discussing decontamination strategies for the 2014 shutdown. The turnaround included ethylene, polyethylene, ethylene glycol and utilities units. An unprecedented 30 day window was scheduled in which to complete decontamination, internal inspection, debottlenecking, and repairs. Five days were allotted to decontaminate 40 pieces of equipment. The quench water system was identified as the critical path.

## Challenges

The plant had encountered problems with its 2006 turnaround due to extended time taken to prepare units for entry and large amounts of liquid waste and sludge. Recent laws had also changed in Kuwait, not allowing liquid waste to be taken off-site. Therefore, the plant was looking for a solution to drastically reduce both the amount of effluent and secondary treatment required.

## Past Procedure

During the previous turnaround, the company had attempted to circulate an alternate chemical which failed to fully

decontaminate the units and produced large quantities of liquid waste. Other past methods included steam only procedures and nitrogen purging. Both previous methods proved slow and expensive.

## Engineered Solution

After a year of planning and collaboration, ZymeFlow Decon arrived in Kuwait to decontaminate the 40 pieces of equipment with a 16 person crew. The plans included a combination of Vapour-Phase<sup>®</sup> and Boil Out applications using two chemistries. Zyme-Flow UN657 was the main chemistry used for decontamination with the addition of Rezyd-X for areas containing heavy sludge. The critical path quench water column was prepared for entry using Zyme-Flow UN657 in a Vapour-Phase application. For the bottom section of the column a combination of Zyme-Flow UN657 and Rezyd-X in a Boil Out application was utilized.

## Results

Upon completion of decontamination, benzene, LEL, and H<sub>2</sub>S in all units had reached zero with no pyrophoric activity. The critical path quench system was decontaminated in less than 12 hours. ZymeFlow also assisted the plant with unexpected plugged drain lines using Rezyd-X chemistry. ZymeFlow's work significantly reduced steam and effluent disposal and complied with Kuwait's new regulations. The plant completed the turnaround in 30 days and considered ZymeFlow's decontamination a major part of its success. It is implementing the procedure as a Best Practice for preparing process equipment for entry.

